

This Page Is Inserted by IFW Operations  
and is not a part of the Official Record

## **BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning documents *will not* correct images,  
please do not report the images to the  
Image Problems Mailbox.**



(19)

Generated Document

(11) Publication number:

## PATENT ABSTRACTS OF JAPAN

(21) Application number: 06122909

(51) Intl. Cl.: B65G 1/14 E04B 1/24

(22) Application date: 06.06.94

(30) Priority:

(43) Date of application  
publication: 19.12.95

(84) Designated contracting  
states:

(71) Applicant: DAIFUKU CO LTD

(72) Inventor: TSUDA MASARU

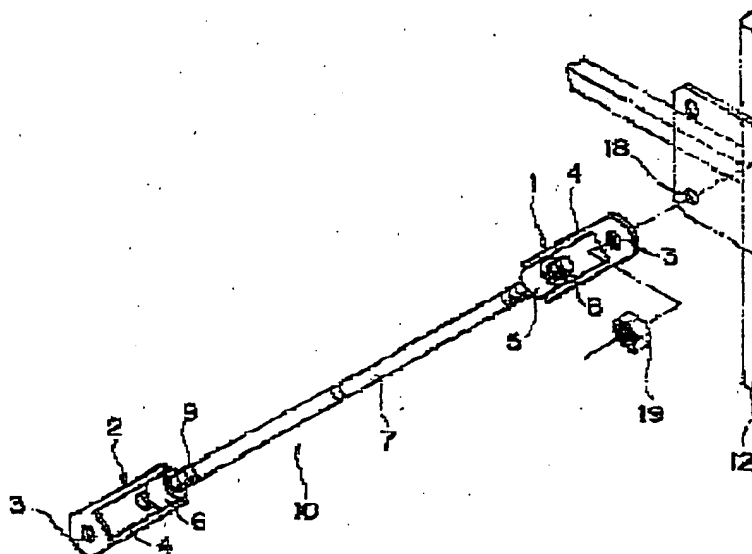
(74) Representative:

### (54) BRACE STRUCTURE FOR RACK

(57) Abstract:

**PURPOSE:** To provide a brace structure for a rack, which can use a small diameter rod, and which can obtain a sufficient tensile strength.

**CONSTITUTION:** In a coupling between braces 10 for a rack, coupling holders 3 in coupling members 1, 2 are aligned with a hole in a mated member 7, and a coupler 9 is associated therefor. The rod 7 is turned so that opposite thread parts 8, 9 are screwed into nut parts 5, 6 so that the brace 10 is laid under a predetermined tension. The rod 7 made of a high tensile strength has a sufficient tensile stress even though it has a small diameter, and accordingly, the coupling members 1, 2 including the rod 7 and the nut parts 5, 6, that is the brace 10 can be made to be small-sized and lightweight. With this arrangement in which the brace 10 is made to be small-sized and lightweight, the bulk of the braces is lowered during conveyance from a manufacturing firm to a job-site where



it is installed, so as to be  
advantageous in cost, thereby it is  
possible to easily and rapidly carry out  
loading and unloading onto and from  
a conveying means, and installation  
work (assembly work).

COPYRIGHT: (C)1995,JPO

[JP,07-330122,A]

CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE INVENTION  
TECHNICAL PROBLEM MEANS OPERATION EXAMPLE DESCRIPTION OF DRAWINGS DRAWINGS

\* NOTICES \*

The Japanese Patent Office is not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] the link member of a couple -- a link -- the structure of the brace for stacks characterized by constituting the rod which formed by Itabe who has a hole, and the nut section united with this Itabe, and formed in ends \*\*\*\*\* screwed in the nut section from high tensile steel

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the structure of the brace for stacks used for the framework stack for automatic warehouses, the framework stack with a slide table, etc.

[0002]

[Description of the Prior Art] The brace for stacks is offered as a turnbuckle looked at by JP,1-131704,U. That is, a turnbuckle is constituted by the rod in which \*\*\*\*\* was formed to ends, and the link implement screwed in these \*\*\*\*\*s. And it is used by arranging between the braces of a stack, and adjustment of tension is enabled by rotating a rod in that case. After a rod corrects a coil-like wire rod in the shape of a straight line so that JP,4-244341,A may see, it is obtained by cutting in a predetermined dimension here, and the quality of the material consists of a plain steel, and it is painted after a disconnection. Moreover, recently, the rod which consists of stainless steel is adopted and paint is made unnecessary.

[0003]

[Problem(s) to be Solved by the Invention] By the way, a framework stack consists of connecting mold material, such as a brace, a horizontal strut, diagonal bracing, and a horizontal beam, and, as for a brace, sufficient stress is needed to tension in that case. Therefore, the thick thing of a path is used as a rod which consists of stainless steel, for example, as a result, large-sized and weight-ization of the rod itself, a link implement, etc., i.e., large-sized and weight-izing of the whole brace, will be caused, and the transport to an installation site serves as \*\* quantity from the manufacture works, it becomes disadvantageous in respect of a cost, and the shipping-and-discharging work or installation work (assembly work) to a means of transportation cannot be performed further easily.

[0004] The place made into the purpose of this invention can use the thin rod of a path, and is in the point of offering the structure of the brace for stacks where sufficient tension stress can moreover be obtained.

[0005]

[Means for Solving the Problem] the structure of the brace [ in / that the above-mentioned purpose should be attained / this invention ] for stacks -- the link member of a couple -- a link -- the rod which formed by Itabe who has a hole, and the nut section united with this Itabe, and formed in ends \*\*\*\*\* screwed in the nut section consists of high tensile steel

[0006]

[Function] the hole which formed the link of the brace for stacks to other objects in other objects according to the above-mentioned configuration of this invention -- a link of both the links member -- the status that the hole was made to agree -- it is -- both -- a hole -- it can carry out by making a link

implement act in between And after a link, by rotating a rod, screwing rotation of both the \*\*\*\*\*s is carried out to the nut section, and the brace for stacks can be arranged by predetermined tension by turnbuckle operation. In that case, since a rod is high tensile steel, even if it makes the path of this rod thin, sufficient tension stress can be obtained, and whole small and lightweight-ization with the rod itself and the link member including the nut section, i.e., the brace for stacks, can be lightweight[ small and ]-ized.

[0007]

[Example] One example of this invention is explained below based on drawing. drawing 1 -- setting -- the link members 1 and 2 of a couple -- a link -- it is formed of ltabe 4 who has a hole 3, and the nut sections 5 and 6 of the shape of a cylinder united with this ltabe 4, and the nut sections 5 and 6 are mutually formed in \*\*\*\* of an opposite direction here While the rod 7 which becomes both the links members 1 and 2 and a group consists of high tensile steel and \*\*\*\*\* 8 and 9 of an opposite direction is formed mutually [ can screw in the ends freely at the above-mentioned nut sections 5 and 6, and ], the rotation control unit (not shown) is formed in the interval of the length orientation. The above-mentioned rod 7 is formed from high tensile steel here. The brace for stacks 10 is constituted by 1-9 of a more than.

[0008] In drawing 2 and the drawing 3 , the framework stack 11 for automatic warehouses which is an example of a stack is constituted by the bracket 16 which projects horizontally toward the brace 12 on either side, respectively in the opposite position of the horizontal strut 13 and the diagonal bracing 14 which carry out link fixation of between two or more braces 12 which opened and set up the predetermined spacing to order and right and left, and the brace 12 of order, the horizontal beam 15 which carries out link fixation of between the braces 12 on either side, and the brace 12 on either side.

And the brace adapter plate 17 is formed in the transposition section of a brace 12 and the horizontal beam 15 at the tooth-back side of the framework stack 11, and the above-mentioned brace for stacks 10 is attached in the shape of a cross between these braces adapter plates 17.

[0009] the bolthole 18 which formed the link to the brace adapter plate 17 and the brace for stacks 10 in this brace adapter plate 17 here -- the above-mentioned link -- it is in the status that the hole 3 was made to agree, and can carry out by making the bolt nut (it being an example of a link implement and you being a rivet format.) 19 act between these holes 18 and 3 And screwing rotation of both \*\*\*\*\*s 8 and 9 is carried out to the nut sections 5 and 6 by rotating a rod 7 through a rotation control unit after a link, and the brace for stacks 10 can be arranged by predetermined tension by turnbuckle operation.

[0010] What is necessary is just to use the thin rod which consists of high tensile steel for the part which was using the thick rod in the conventional plain steel according to the above-mentioned example. Thus, by using the rod 7 which consists of high tensile steel, even if it makes the path of this rod 7 thin, sufficient tension stress will be obtained, therefore rod 7 the very thing and the link members 2 and 3 including the nut sections 5 and 6 can be lightweight[ small and ]-ized, with the whole brace for stacks 10 can be lightweight[ small and ]-ized.

[0011]

[Effect of the Invention] According to this invention of the above-mentioned configuration, since a rod is high tensile steel, even if it makes the path of this rod thin, sufficient tension stress can be expected, and-izing of whole small and lightweight-izing with the rod itself and the link member including the nut section, i.e., the brace for stacks, can be carried out [ small and lightweight ]. therefore, the transport to an installation site from the manufacture works -- \*\* -- it can carry out by making it low, and with it being advantageous in respect of a cost, it becomes and the shipping-and-discharging work to a means of transportation and installation work (assembly work) can be performed further quickly easily

---

## Field

---

[Field of the Invention] This invention relates to the structure of the brace for stacks used for the framework stack for automatic warehouses, the framework stack with a slide table, etc.

---

## Technique

---

[Description of the Prior Art] The brace for stacks is offered as a turnbuckle looked at by JP,1-131704,U. That is, a turnbuckle is constituted by the rod in which \*\*\*\*\* was formed to ends, and the link implement screwed in these \*\*\*\*\*s. And it is used by arranging between the braces of a stack, and adjustment of tension is enabled by rotating a rod in that case. After a rod corrects a coil-like wire rod in the shape of a straight line so that JP,4-244341,A may see, it is obtained by cutting in a predetermined dimension here, and the quality of the material consists of a plain steel, and it is painted after a disconnection. Moreover,

recently, the rod which consists of stainless steel is adopted and paint is made unnecessary.

---

#### Effect

[Effect of the Invention] According to this invention of the above-mentioned configuration, since a rod is high tensile steel, even if it makes the path of this rod thin, sufficient tension stress can be expected, and-izing of whole small and lightweight-izing with the rod itself and the link member including the nut section, i.e., the brace for stacks, can be carried out [ small and lightweight ]. therefore, the transport to an installation site from the manufacture works -- \*\* -- it can carry out by making it low, and with it being advantageous in respect of a cost, it becomes and the shipping-and-discharging work to a means of transportation and installation work (assembly work) can be performed further quickly easily

---

#### TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] By the way, a framework stack consists of connecting mold material, such as a brace, a horizontal strut, diagonal bracing, and a horizontal beam, and, as for a brace, sufficient stress is needed to tension in that case. Therefore, the thick thing of a path is used as a rod which consists of stainless steel, for example, as a result, large-sized and weight-ization of the rod itself, a link implement, etc., i.e., large-sized and weight-izing of the whole brace, will be caused, and the transport to an installation site serves as \*\* quantity from the manufacture works, it becomes disadvantageous in respect of a cost, and the shipping-and-discharging work or installation work (assembly work) to a means of transportation cannot be performed further easily.

[0004] The place made into the purpose of this invention can use the thin rod of a path, and is in the point of offering the structure of the brace for stacks where sufficient tension stress can moreover be obtained.

---

#### MEANS

[Means for Solving the Problem] the structure of the brace [ in / that the above-mentioned purpose should be attained / this invention ] for stacks -- the link member of a couple -- a link -- the rod which formed by Itabe who has a hole, and the nut section united with this Itabe, and formed in ends \*\*\*\*\* screwed in the nut section consists of high tensile steel

---

#### OPERATION

[Function] the hole which formed the link of the brace for stacks to other objects in other objects according to the above-mentioned configuration of this invention -- a link of both the links member -- the status that the hole was made to agree -- it is -- both -- a hole -- it can carry out by making a link implement act in between And after a link, by rotating a rod, screwing rotation of both the \*\*\*\*\* is carried out to the nut section, and the brace for stacks can be arranged by predetermined tension by turnbuckle operation. In that case, since a rod is high tensile steel, even if it makes the path of this rod thin, sufficient tension stress can be obtained, and whole small and lightweight-ization with the rod itself and the link member including the nut section, i.e., the brace for stacks, can be lightweight[ small and ]-ized.

---

#### EXAMPLE

[Example] One example of this invention is explained below based on drawing. drawing 1 -- setting -- the link members 1 and 2 of a couple -- a link -- it is formed of Itabe 4 who has a hole 3, and the nut sections 5 and 6 of the shape of a cylinder united with this Itabe 4, and the nut sections 5 and 6 are mutually formed in \*\*\*\* of an opposite direction here While the rod 7 which becomes both the links members 1 and 2 and a group consists of high tensile steel and \*\*\*\*\* 8 and 9 of an opposite direction is formed mutually [ can screw in the ends freely at the above-mentioned nut sections 5 and 6, and ], the rotation control unit (not shown) is formed in the interval of the length orientation. The above-mentioned rod 7 is formed from

high tensile steel here. The brace for stacks 10 is constituted by 1-9 of a more than.

[0008] In drawing 2 and the drawing 3, the framework stack 11 for automatic warehouses which is an example of a stack is constituted by the bracket 16 which projects horizontally toward the brace 12 on either side, respectively in the opposite position of the horizontal strut 13 and the diagonal bracing 14 which carry out link fixation of between two or more braces 12 which opened and set up the predetermined spacing to order and right and left, and the brace 12 of order, the horizontal beam 15 which carries out link fixation of between the braces 12 on either side, and the brace 12 on either side. And the brace adapter plate 17 is formed in the transposition section of a brace 12 and the horizontal beam 15 at the tooth-back side of the framework stack 11, and the above-mentioned brace for stacks 10 is attached in the shape of a cross between these braces adapter plates 17.

[0009] the bolthole 18 which formed the link to the brace adapter plate 17 and the brace for stacks 10 in this brace adapter plate 17 here -- the above-mentioned link -- it is in the status that the hole 3 was made to agree, and can carry out by making the bolt nut (it being an example of a link implement and you being a rivet format.) 19 act between these holes 18 and 3 And screwing rotation of both \*\*\*\*\*s 8 and 9 is carried out to the nut sections 5 and 6 by rotating a rod 7 through a rotation control unit after a link, and the brace for stacks 10 can be arranged by predetermined tension by turnbuckle operation.

[0010] What is necessary is just to use the thin rod which consists of high tensile steel for the part which was using the thick rod in the conventional plain steel according to the above-mentioned example. Thus, by using the rod 7 which consists of high tensile steel, even if it makes the path of this rod 7 thin, sufficient tension stress will be obtained, therefore rod 7 the very thing and the link members 2 and 3 including the nut sections 5 and 6 can be lightweight[ small and ]-ized, with the whole brace for stacks 10 can be lightweight[ small and ]-ized.

---

## DESCRIPTION OF DRAWINGS

---

### [Brief Description of the Drawings]

[Drawing 1] one example of this invention -- being shown -- a part of brace for stacks -- it is a notching perspective diagram

[Drawing 2] It is the rear view of the principal part of the framework stack which used the brace for the said stacks.

[Drawing 3] It is the side elevation of the framework stack which used the brace for the said stacks.

### [Description of Notations]

1 Link Member

2 Link Member

3 a link -- a hole

4 Itabe

5 Nut Section

6 Nut Section

7 Rod

8 \*\*\*\*\*

9 \*\*\*\*\*

10 Brace for Stacks

11 Framework Stack

12 Brace

13 Horizontal Strut

14 Diagonal Bracing

15 Horizontal Beam

16 Bracket

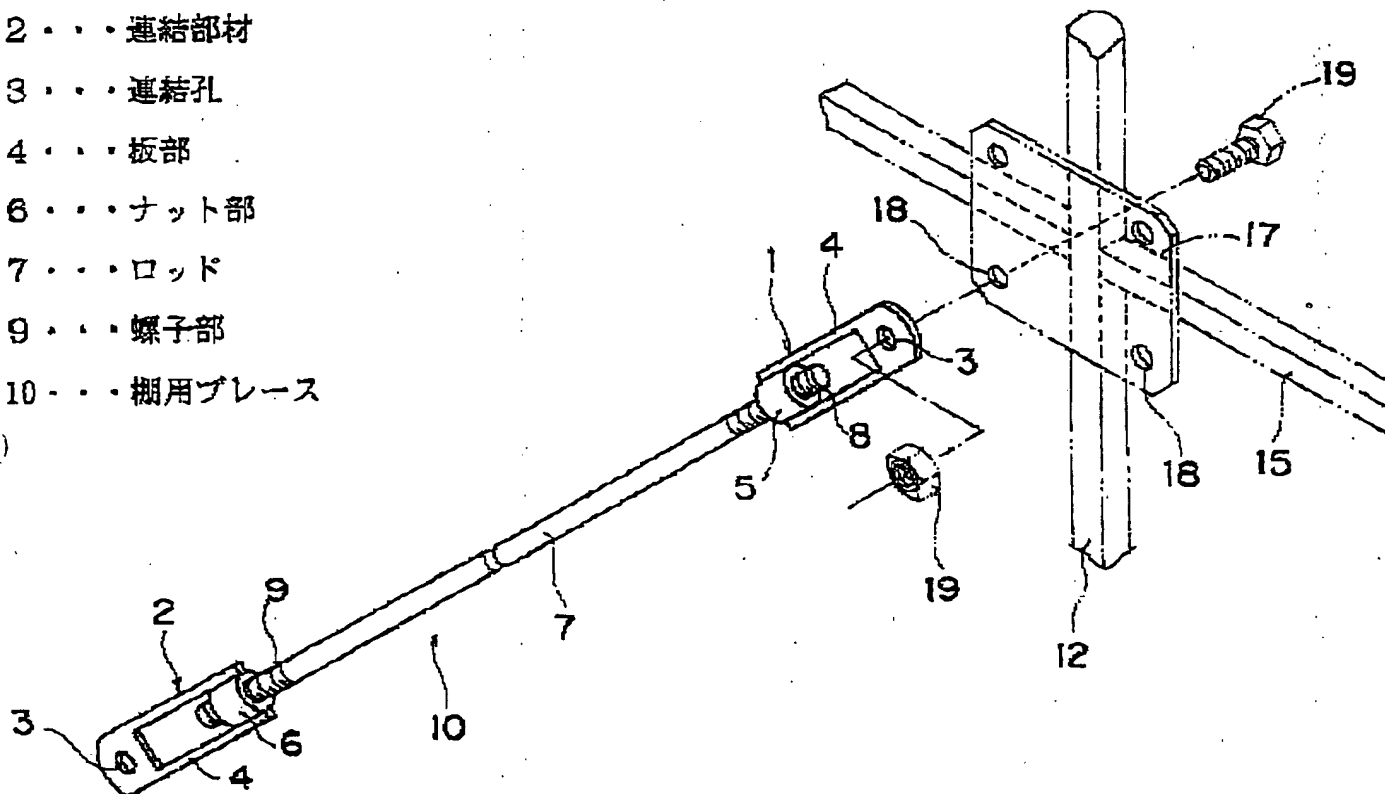
17 Brace Adapter Plate

18 Bolthole

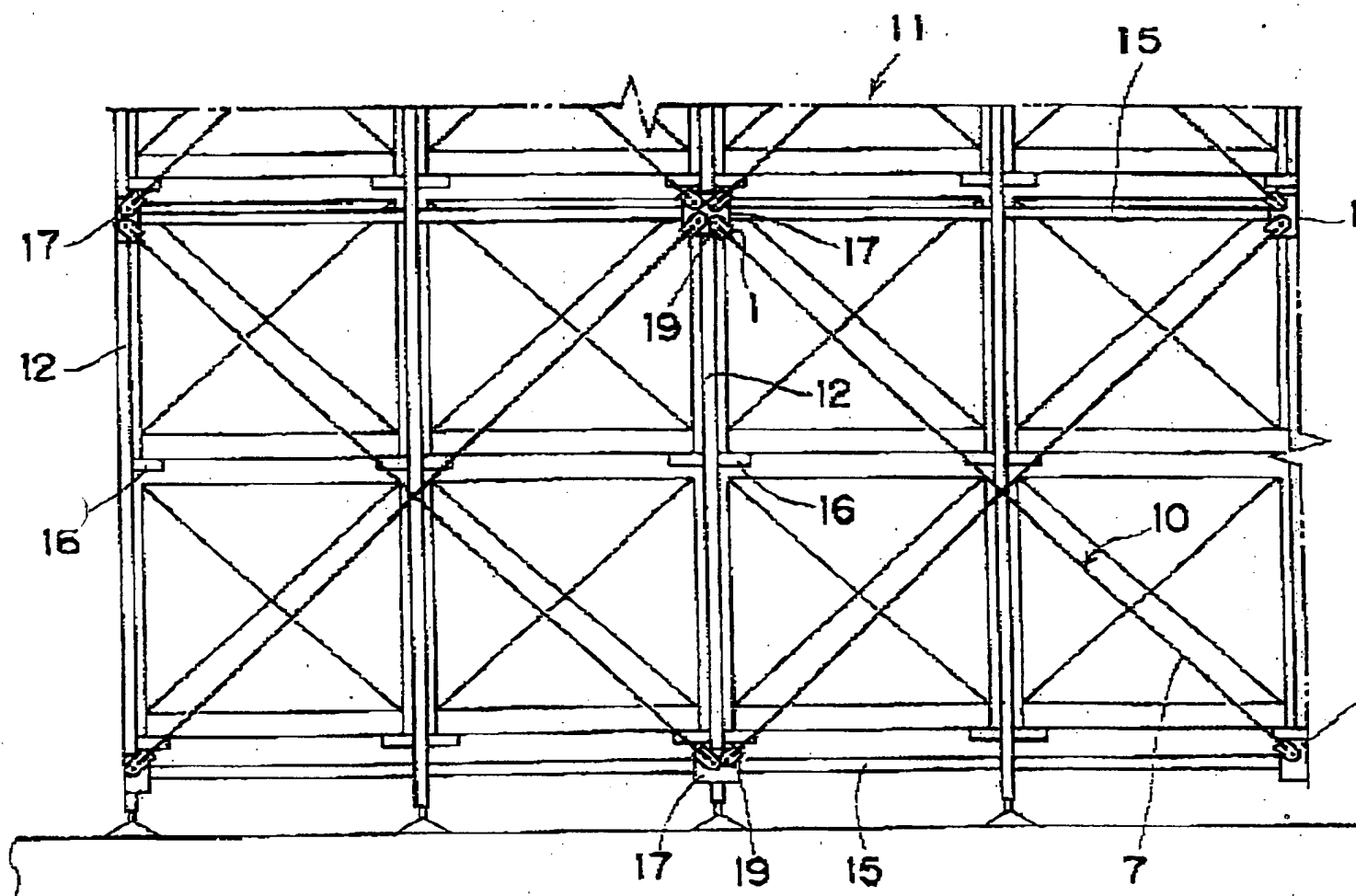
19 Bolt Nut (Link Implement)

# DRAWING ONE

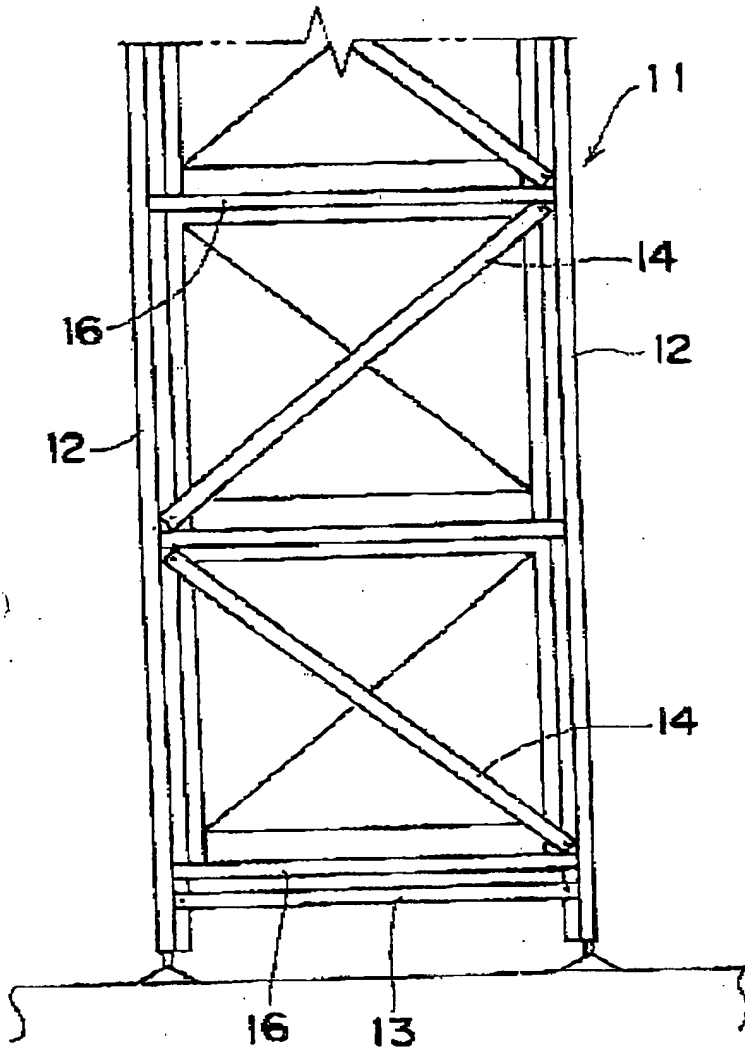
- 1, 2 . . . 連結部材
- 3 . . . 連結孔
- 4 . . . 板部
- 5, 6 . . . ナット部
- 7 . . . ロッド
- 8, 9 . . . 螺子部
- 10 . . . 棚用ブレース







DRAWING TWO



DRAWING THREE